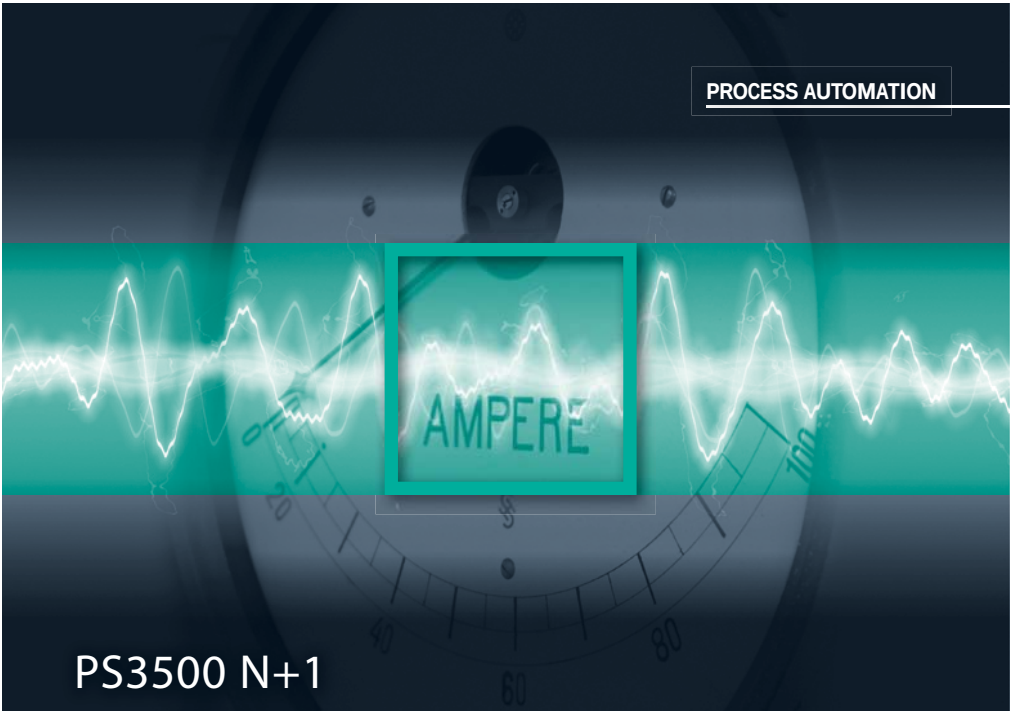

PS3500 N+1

REDUNDANT POWER SUPPLY
INSTALLATION & OPERATION MANUAL

PEPPERL+FUCHS
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1 Introduction

This manual applies to the Pepperl+Fuchs PS3500 system that consists of the products shown in Table 1:

Model number	Description
PS3500-PM-1.24.15	N+1 power supply module, 24 V DC @ 15 A
PS3500-TB-3	Backplane for three power modules and one diagnostic module
PS3500-TB-6	Backplane for six power modules and one diagnostic module

Table 1. PS3500 series product range

The manual assumes that the user has technical knowledge of and experience with power supply systems, explosion protection, as well as planning and installing power systems. It does not provide an introduction to power systems or explosion protection for inexperienced users. The content of this manual applies in conjunction with the respective data sheets, Declaration of Conformity and Certificate of Compliance. For further information please refer to the Pepperl+Fuchs "Wiring and Installation Guide."

Substantial amounts of voltage, current and power are provided by the supply. Read this manual carefully before installation and operation to avoid risk of damage, failures, or personal injury. Take great care on input and output supply lines to protect from the effects of short circuits and provide the required ground connections.

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2 Instructions

2.1 Intended use

STOP
Warning

The PS3500 product range may be installed in Zone 2 or Class I/Division 2 hazardous areas. Type of protection is Ex nA nC (non-arcing, sealed device) for Zone 2 Gas Groups IIC, and non-incendive for use in Class I Division 2 Gas Groups A, B, C, and D. Please consult local electrical codes for hazardous location installation guidelines.

NOTE: This equipment is suitable for use in Class I, Division 2; Groups A, B, C, D and Class I, Zone 2; Group IIC or nonhazardous locations only.

The Declaration of Conformity, Certificate of Compliance and data sheets are considered as an integral part of this user manual. The data sheets contain the electrical data of the Declaration of Conformity and the Certificate of Compliance. Laws and/or regulations governing the use or intended use must be observed.

The PS3500 products are only approved for proper professional use in accordance with the intended purposes. Improper handling will void any claim made under the warranty as well as any manufacturer's liability. The PS3500 system can only be operated by trained professionals in accordance with this manual.

2.2 Product label

For proper identification and operation, examine the system model number nameplate to identify the appropriate approvals, area classification, and type as noted in Figure 1:

PEPPERL+FUCHS
Twinsburg, OH 44087 USA / www.pepperl-fuchs.com
PS3500-PM-1.24.15
Part No. 913919
Input: 90...250VAC
44...66Hz
90...300VDC
6.5A max
Output: 22.5...30VDC
15A
4KM0
II 3 G Ex nA nC IIC T4 Gc
12ATEX1103387X
IECEx UL 13.0082X
Certified to UL STD 508
Certified to ANSI/ISA STD 12.12.01
Certified to CSA STD C22.2 No. 107.1
Certified to CSA STD C22.2 No. 213
Class I, Division 2,
Groups A, B, C, D, T4
Class I, Zone 2,
Groups IIC, T4
Industrial Control Equipment for use in Hazardous Locations
WARNING - DO NOT SEPARATE WHEN ENERGIZED UNLESS AREA IS KNOWN TO BE NONHAZARDOUS
AVERTISSEMENT - RISQUE D'EXPLOSION. NEPAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX
-25°C ≤Tamb ≤45°C Type 1 (70°C derated)
WARNING - HOT SURFACE - RISK OF BURN
Avertissement - surface chaude - risk de brûlures
See Manual for operating instructions

Figure 1. Power Supply Module

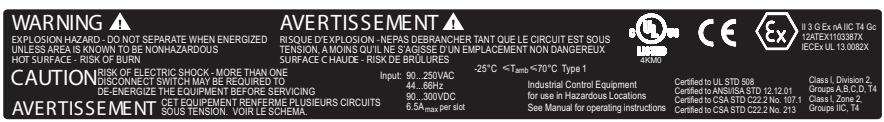
WARNING
EXPLOSION HAZARD - DO NOT SEPARATE WHEN ENERGIZED UNLESS AREA IS KNOWN TO BE NONHAZARDOUS
HOT SURFACE - RISK OF BURN
AVERTISSEMENT
RISQUE D'EXPLOSION - NEPAS DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX
SURFACE C HAUDE - RISK DE BRÛLURES
CAUTION
RISK OF ELECTRIC SHOCK - MORE THAN ONE DISCONNECT SWITCH MAY BE REQUIRED TO DE-ENERGIZE THE EQUIPMENT BEFORE SERVICING
AVERTISSEMENT
CET EQUIPEMENT RENFERME PLUSIEURS CIRCUITS SOUS TENSION. VOIR LE SCHEMA.
Input: 90...250VAC
44...66Hz
90...300VDC
6.5A max per slot
-25°C ≤Tamb ≤70°C Type 1
Industrial Control Equipment for use in Hazardous Locations
See Manual for operating instructions
4KM0
II 3 G Ex nA IIC T4 Gc
12ATEX1103387X
IECEx UL 13.0082X
Certified to UL STD 508
Certified to ANSI/ISA STD 12.12.01
Certified to CSA STD C22.2 No. 107.1
Certified to CSA STD C22.2 No. 213
Class I, Division 2,
Groups A,B,C,D, T4
Class I, Zone 2,
Groups IIC, T4

Figure 2. Backplane

2.3 Mounting

*2.3.1 Mounting PS3500 backplanes (termination boards) PS3500-TB-**

The PS3500 backplanes are designed for protection class IP20 in accordance with EN 60529 and must be protected against adverse ambient conditions such as water or dirt ingress.

The backplane chassis is mounted on a flat metal sheet plate or on two properly spaced rails. Drill four 5 mm (0.2") DIA holes and tap them 6 MA (or 1/4" NC). Insert the top and bottom screws but leave a gap of approximately 5 mm (0.2") between the screw heads and mounting surface. Slide the chassis through the keyed holes and hang it firmly on the screw heads. Proceed to tighten all the screws.

2.3.2 Mounting PS3500-PM-1.24.15 power modules

The housing of PS3500-PM-1.24.15 meets the degree of protection class IP 20. It is intended for mounting on the PS3500 backplane PS3500-TB-*.

To install a new module on the backplane proceed as follows:

1. Carefully center and mate the plug and connector on the back of the power module to the backplane; then press firmly on the module.
2. With a screwdriver, screw in the top and bottom mounting screw on the power module to secure the module in the slot.
3. The modules are hot swappable; they can be replaced without shutting down the system. See Section 5.2, *Hot swapping*.

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3 Specifications

PS3500 has a wall-mount, multi-slot backplane accepting hot swappable plug-in power converter modules that provides an isolated output at 24 V DC nominal.

Each power module has an individually isolated input port accepting either AC or DC that provides inrush current limiting and power factor control. The output port is completely isolated from the input and provides up to 15 A per module at a nominal 24 V DC (adjustable 22.5 to 30 V from chassis mounted trimmer) with a load sharing configuration for paralleled output operation. Input and output lines can be wired independently or in parallel providing N+1 redundant structures.

System configuration is obtained by wiring and configuration DIP switches on the various backplane slots leaving power modules interchangeable and easily swappable under load. All relevant failures in the modules are detected and signaled by individual LEDs and alarm relays providing a flexible combination of redundancy, fault tolerance, and automatic fault detection ideally suited to critical applications.

Full compliance to the EU directives for EMC and low-voltage equipment ensure minimum emissions and high immunity in harsh environments. High conversion efficiency normally permits natural convection cooling operation eliminating cooling fans for most application requirements.

3.1 Power supply module specifications

Mechanical specifications	
Dimensions	(134 mm x 62 mm x 268 mm) 5.3” x 2.5” x 10.6”
Input	
Voltage	90…250 V AC ±10%; 90...300 V DC, overvoltage category II
Input current	Max. 6.5 A
Efficiency	Up to 91%
Inrush current	< 50 A peak for 50 µs
Power factor	> 0.97, 50...100% load
Output	
Voltage	24 V DC +/-1%, adjustable between 22.5...30 V
Current	15 A
Fault signal	Relay 50 V/0.6 A or 30 V/1 A DC
Short-circuit current	≤ 20 A
Temperature coefficient	±0.01% per °C max
Input regulation	< 100 mV (90 ... 250 V AC ; 90 ... 300 V DC)
Load regulation	<100 mV (0...15 A output load)
Turn-on/turn-off voltage transient	200 ms to final value (no over/under shoot)
Ripple	35 mV $_{rms}$ (< 100 mV $_{pp}$)
Response time	Min. hold-up time: ≥ 25 ms at nominal input voltage & output load
Indicators/settings	
Display elements	LED Power, green: power on LED Fault, red: fault indication LED Alarm, red: module shut-down

Table 2. Power supply module specifications

3.2 System specifications

Electrical isolation	
Input/output	4.25 kV DC 3.0 kV AC
Input/ground	2.12 kV DC 1.5 kV AC
Output/ground	2.12 kV DC 1.5 kV AC
Ambient conditions	
Ambient temperature	-25…+45 °C derated: 0.4 A/°C , (from 45...70 °C)
Altitude	Installation is 2000 m or less
Polution degree	Polution degree 2 or 1
Storage temperature	-40…+85 °C
Shock resistance	15 g, 11 ms
Vibration resistance	1 g, 58...150 Hz
Relative humidity	< 95 % non condensing
Mechanical specification	
Protection degree	IP20
Weight	Approximately 1.8 kg (4.125 lbs)
Directive conformity	
Electromagnetic compatibility	
Directive 2004/108/EC	EN 61326-1:2006 EN 61000 sections 4-2, 4-4, and 4-6 EN 55011
Conformity	
Electrical isolation	IEC 61131-2
Electromagnetic compatibility	NE 21
Protection degree	EN 60529
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6

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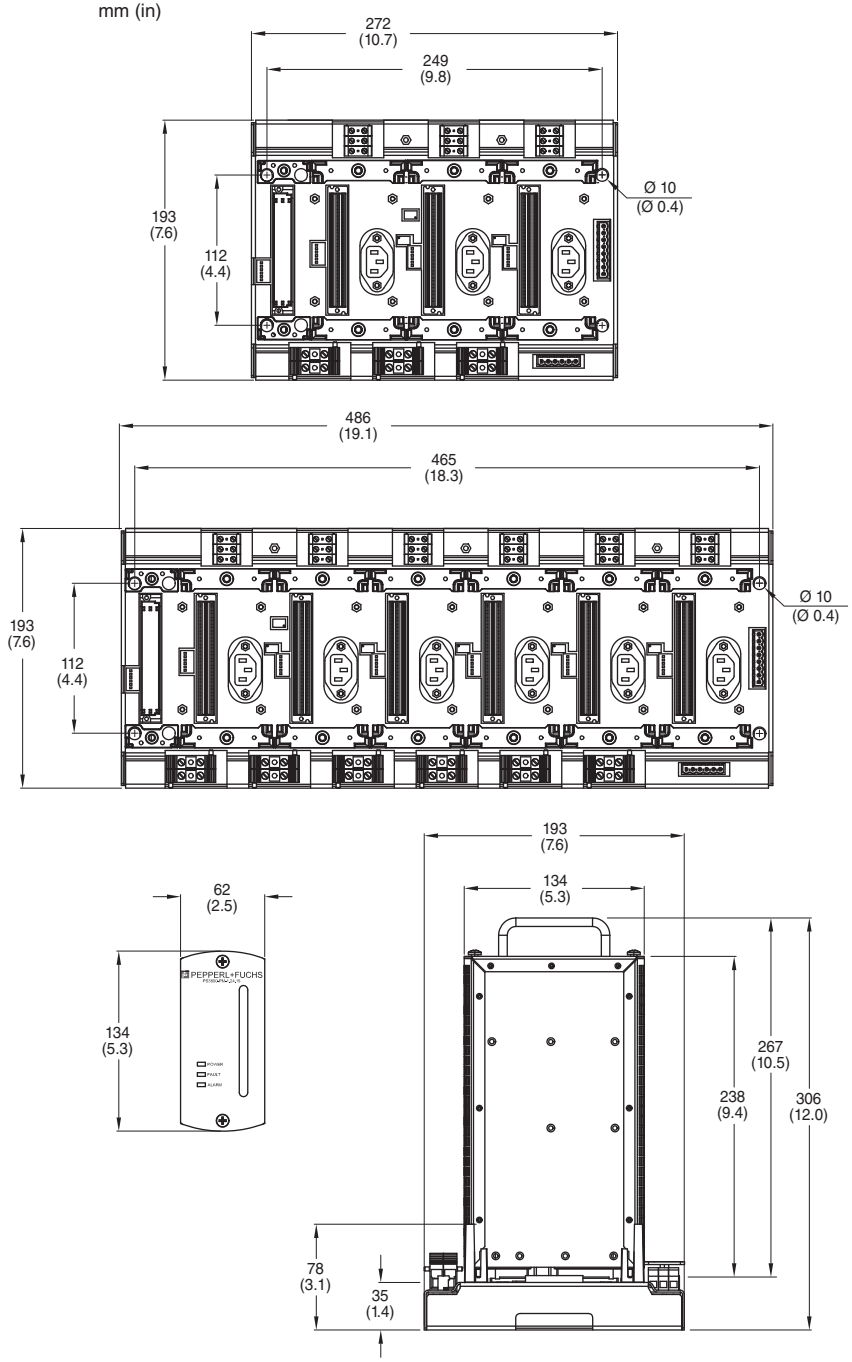
3.2 System specifications (continued)

Data for application in conjunction with hazardous areas	
Type Examination Certificate	12ATEX1103387X Rev.1
Group, category, type of protection	Ⓔx II3 G Ex nA nC IIC T4 (PS3500-PM) Ⓔx II3 G Ex nA IIC T4 (PS3500-TB)
Directive conformity	
Directive 94/9 EC	EN 60079-0, EN 60079-15, EN 61010-1
International approvals	
IECEx approvals	Ex nA nC IIC T4 (PS3500-PM) Ex nA IIC T4 (PS3500-TB) IECEx UL 13.0082X
UL Listed	ANSI/ISA 12.12.01-2011 UL 508 CSA C22.2 No. 213-M1987, CSA C22.2 No. 107.1
Approved for	Class I, Zone 2, Group IIC T4 Class I, Division 2, Groups A, B, C, D, T4
General information	
Supplementary information	Statement of Conformity, Declaration of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

Table 3. System specifications

3.3 Dimensions

mm (in)



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4 Temperature considerations

Temperature accelerates the failure mechanism of every electronic component (Arrhenius criteria). If the operating temperature is increased by 10 °C from its normal operating range, -25…+45 °C (-11...+113 °F), its expected life is almost cut in half.

Temperature rise depends on dissipated power density. For the same enclosure volume more power dissipated produces higher temperature rise. For example, a cabinet 600 x 600 x 2000 mm dissipating 300 W with natural convection cooling produces an internal temperature rise of 10 °C. This should be regarded as an ideal case.

Identify the worst load/temperature environment that the power supply will encounter and determine the recommended cooling method.

- ***Use convection cooling*** when the supply load/operating temperature is typically in the lower part of the diagram and free air circulation is ensured.
- ***Use forced cooling*** when the supply load/operating temperature is in the upper part of the diagram for extended periods of time or when a very high system reliability is required.

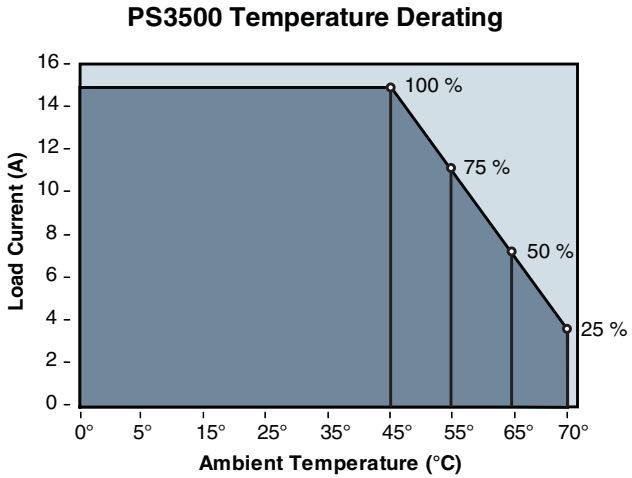


Figure 3. Recommended load current per module vs. operating temperature

4.1 Convection cooling

Hot components exchange heat with the surrounding air producing a vertically rising hot air flow. This determines new cool air intake to cool the component in a natural convection cooling mode, which is controlled by the intake air temperature and flow.

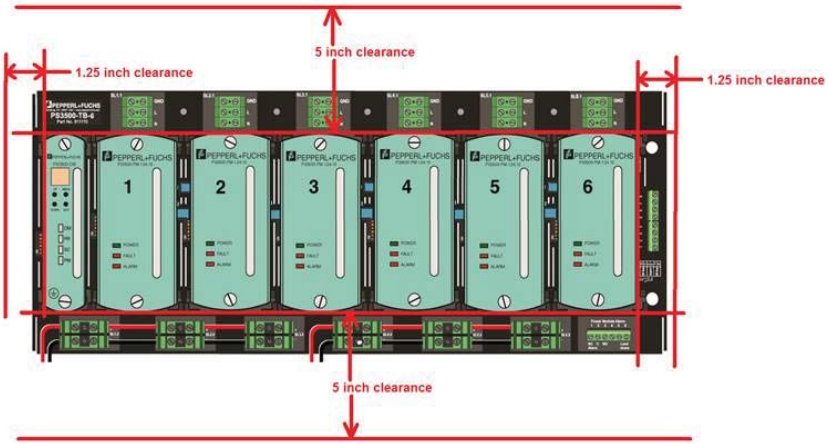
For good convection cooling, install the equipment with an unobstructed vertical flow of relatively cool (ambient temperature) air entering from the bottom and flow out at a higher temperature from the top. To avoid excessive temperature build up, do not stack power dissipating devices vertically in close proximity.

4.2 Forced cooling

Forced cooling is obtained by using suitable fans. Fans generate a strong air flow that removes heat from the power generating equipment. Use two (PS3500-TB-3) or four (PS3500-TB-6) 120 mm, 100 m³/h, brushless, long-life fans operated from the output bus at 24 V DC (e.g., PAPST type) installed immediately below the backplanes and blowing air up against the bottom of the power modules. Make sure to allow relatively free airflow below the fans and above the supply rack.

4.3 Clearances

For clearances, we would recommend 1.25” from the sides of the power supplies, and 5” from the top and bottom when oriented in the standard horizontal position, for convection cooling. If using forced air convection cooling, this may be reduced some. This assumes that below the backplane is not another source of heat.



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5 Technical concept

The power supply system consists of two different backplanes (3 and 6 slots) and the power supply module. The key features of the system are:

- Nominal output 24 V/15 A per module
- Nominal input of 90 to 250 V AC/90 to 300 V DC per module
- N+1 redundancy
- Automatic load-sharing
- High efficiency (up to 91%)
- Fanless
- Module output voltage is adjustable at the backplane from 22.5 V to 30 V
- Basic module failure alarming via relay contact (normally open/close configurable)
- Redundancy on supply line

5.1 N+1 redundancy

N+1 redundancy is based on the fact, that the maximum drawn current is lower than the maximum current provided by the overall number of modules minus one. Based on the backplane size, N can be any number between 1 and 5.

5.2 Hot swapping

Hot swapping allows replacement of a module under power without any visible functional impact on the output side. Hot swapping is allowed only in an environment where no hazardous materials are present. The hot swapping feature is not permitted in a Class I/ Div 2 area or Zone 2 area unless under a hot permit.

5.3 Automatic load-sharing

The power supply modules implement a real load-sharing function; all modules supply the same amount of current. The tolerance for the current difference between the modules should be within a range of ±1.5 A.

5.4 Variable output voltage

The factory default output voltage is 24 V. The output voltage is adjustable in a range from 22.5 V to 30 V for each module by using a potentiometer. Inserted modules can be easily adjusted with a screwdriver during setup. Potentiometers are accessible on the adjacent backplane slot making the voltage setting tamper proof during operation.

5.5 Alarm output

Each power module has its own alarm monitoring circuit that controls a relay for a common failure output signal. It can be configured normally open or normally closed using the terminal blocks on the backplane.

5.6 Internal diagnostics, recovery, and LEDs

Overvoltage (OV), overcurrent (OC) and overheat (OHT) conditions lead to an output shutdown of the unit. Also, they create an alarm signal at the internal relay. Undervoltage (UV) creates an alarm, but does not shutdown the unit.

During shutdown mode, the unit continuously checks for the actual failure condition to go away. If that is the case, the unit would go back to normal operation. However, this behavior must not impact the remaining running units in an N+1 redundant system.

There are three LEDs:

- Power good (green)
- Fault (red)
- Alarm (red)

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6 Wiring

The PS3500 system has separate input/output terminal blocks for simple configuration.

Warning

Connect ground terminals to the mains ground, otherwise lethal voltages may occur.

Permanent power module damage will result in case of input voltage overload.

6.1 Special conditions of use

1. To be installed in an end-use ATEX approved system, providing fire, impact, grounding, and accessibility protection. The power supply must be installed in an ATEX Certified, IP54 enclosure. Alternatively, the power can be installed in an IP4X enclosure, having adequate protection against the entry of solid foreign objects or water capable of impairing safety.
2. GND connection on backplane at Mains supply connections is a protective ground connection. The wire guage should be at least the same as what is used for the mains power feed.
3. For any hazardous locations (Class I/Div 2, Zone 2) the PS3500 system must be installed in a locked enclosure.
4. Power supply must be secured to system using screws requiring tools for removal.
5. For indoor use only; not to be subjected to UV exposure from luminaires.
6. Ambient ratings for operation are -25…+45 °C, derated 0.4 A/°C (from 45...70 °C). See Figure 3, temperature curve.
7. The PS3500 system is designed for use in pollution degree 2 environments.
8. For use with Class 1 conductors or equivalent.
9. For use with CU conductors or equivalent.
10. Use 14 AWG conductors or equivalent.
11. Use conductors rated 75 °C minimum or equivalent.
12. Alarm relay contacts are rated for 50 VDC or less and are intended to be powered by DC sources with proper isolation from MAINS.

6.2 Input supply line

Power line voltage is 90...250 V AC ±10% (90...300 V DC). Check supply line voltage to meet power module supply requirements. Plan for disconnecting capability and over-current protection by adequately sized fuses or circuit breakers on the lines.

Circuit breakers or fusing shold be 20A or less. connections to 6 poition backplane will require 2 breakers or fused sources feeding the backplane. Group of 3 slots needs 20A breaker or less. A single 40A breaker is not allowed.

Ground connection should be made first.

Input Terminals

strip length = 8mm

wire guage max = 4mm sq (10AWG)

tightening torque 0.6 - 0.8Nm

Output Terminals

strip length = 12mm

wire guage max = 10mm sq (6AWG)

tightening torque 1.2 - 1.5N

Other Terminals

strip length = 7mm

wire guage max = 2.5mm sq (12AWG)

tightening torque 0.5 - 0.6Nm

6.3 Input configurations

6.3.1 Single line input

Use with uninterruptible power systems (UPS) supply or when input line integrity is not critical, wire per sketch in Figure 4. For DC input, polarity does not matter

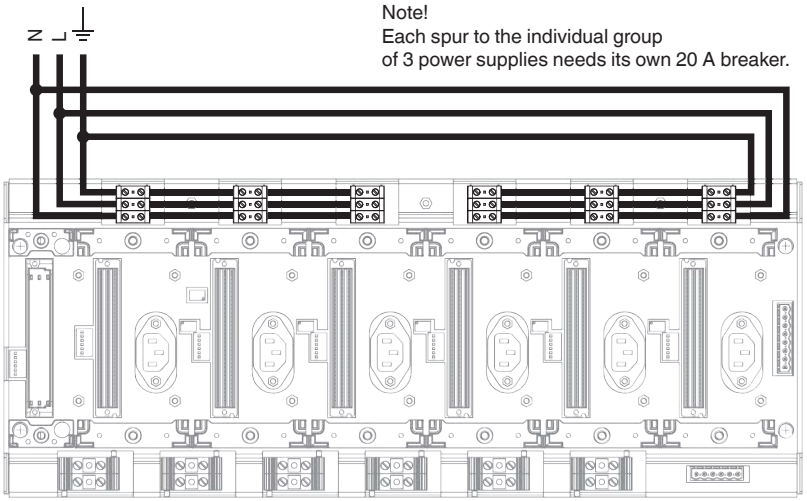

Figure 4. Single line input connection

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6.3.2 Dual Line Input

Wire per sketch in Figure 5. For redundant input line configuration, load should not exceed 45 Amps per every 6-position backplane used.

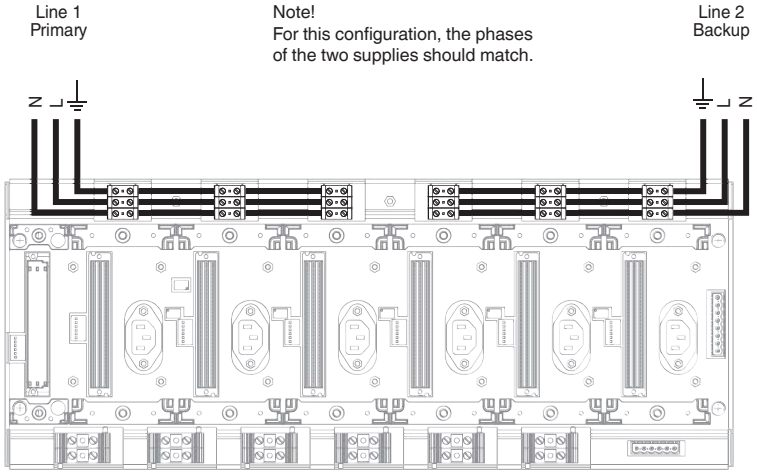

Figure 5. Dual line input connection

6.3.3 Independent line connection

Wire per sketch in Figure 6. For independent input line configuration, load should remain separated.

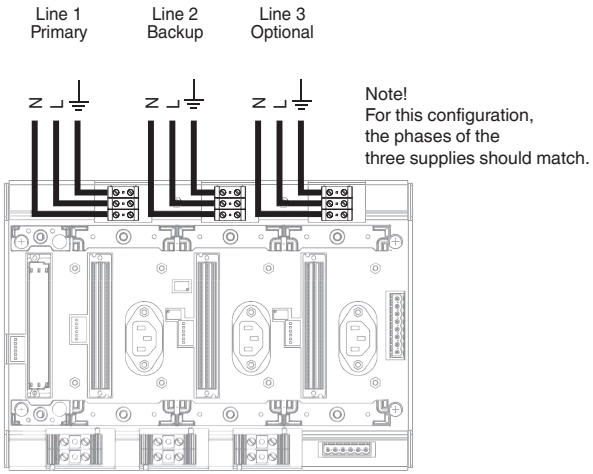

Figure 6. Independent multi input line connections

6.4 Output configuration

Each power module slot has a 6-position DIP switch that enables the various alarm configurations as well as the load sharing ability of each PS3500 power module. See Table 4 for proper configuration. These configurations are on a per slot basis.

	Sx.1	Sx.2	Sx.3	Sx.4	Sx.5	Sx.6
Parallel alarm	Off	On	Off	Off	x	x
Serial alarm+	On	Off	On	On/ Off*	x	x
Load share OFF	x	x	x	x	Off	Off
Load share ON	x	x	x	x	On	On

*Any slot not having a module should have DIP switch #4 turned on
+Slot #1, S1.1 and S1.2 are in parallel therefore either one can be on.

Table 4. Alarm/load sharing configuration

6.4.1 Independent outputs

Use for separate output applications; wire per Figure 7.

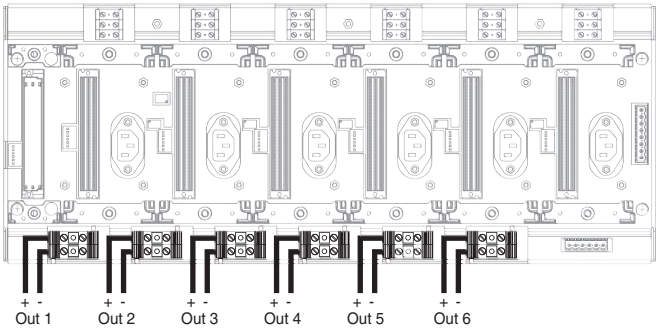

Figure 7. Independent output lines

6.4.2 Common outputs

Use for bus connected output or redundant configurations; wire per Figure 8. Refer to Table 4 for load share DIP switch configuration. For multi backplane parallel operation, extend load sharing connections at terminals 5 and 6 to the next backplane.
NOTE: A separate bus is required for loads > 45 A.

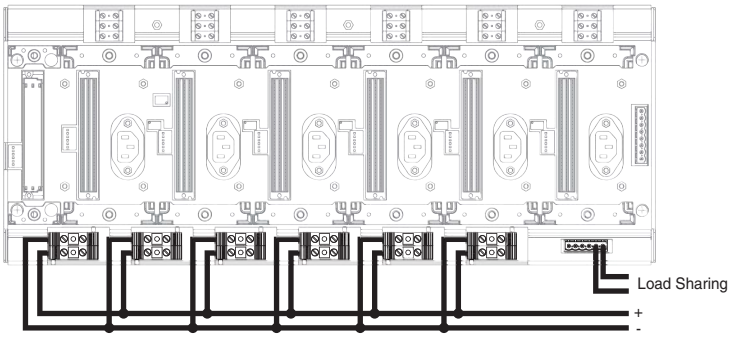

Figure 8. Bus connected output or redundant configurations

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6.5 Alarm configuration

6.5.1 Parallel alarm

Connect in parallel, as per Figure 9, the normally closed (N.C.) alarm contacts on all power modules, and refer to Table 4 for parallel alarm DIP switch configuration. When any specific relay on a module deenergizes under alarm condition, including power off, the circuit will close and actuate an alarm (at terminals 1-2 of the alarm terminal block). Pulling a power module out of the backplane will not actuate an alarm.

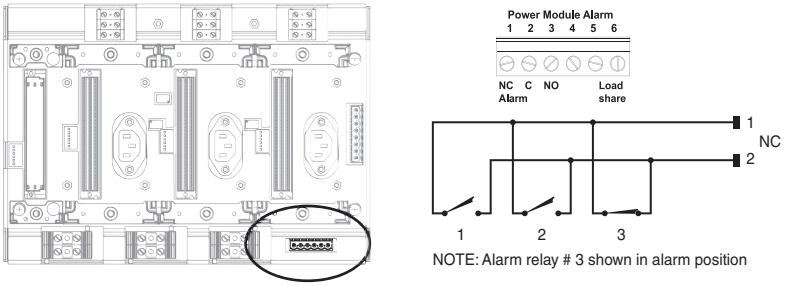


Figure 9. Parallel alarm

6.5.2 Serial alarm

Connect in series, as per Figure 10, the normally open (N.O.) alarm contacts on all power modules and refer to Table 4 for serial alarm DIP switch configuration. When any specific relay on a module de-energizes under alarm condition, the circuit will open and cause an alarm. Removing a module will set off the alarm. Any slot without a module will need to have DIP switch Sx.4 turned on.

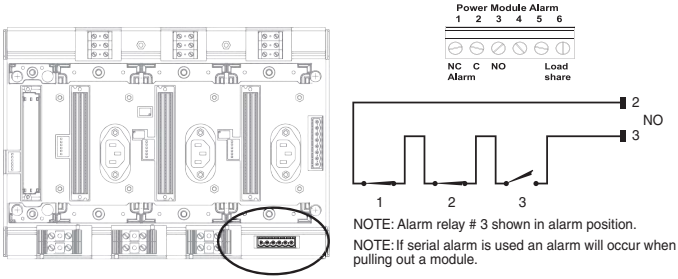
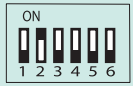
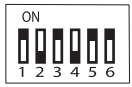
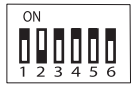
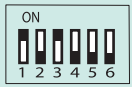
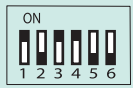


Figure 10. Serial alarm connection

7. Output configurations

Alarm configuration	Module	No module (empty slot)
Parallel with Load Share	Sx OFF = Open	
Parallel without Load Share	Sx 	
Serial with Load Share	Sx 	Sx 
Serial without Load Share	Sx 	Sx 

Note: **Diagnostic Module DIP Switches**

When the Diagnostic Module is not in use, all Diagnostic Module port DIP switches must be set to the "OFF" position.

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8. Operations

Warning

Warning!

Do not plug and power modules on the backplane before checking all the systems as recommended.

8.1 Supply line checks

1. Grounding conductor to be connected and firmly secured to the GND terminals.
2. Input lines to be protected by appropriately sized fuses or sectioning circuit breakers (turning them off).
3. Line conductors to be of adequate size and firmly secured with no exposed conductors risking contacts with the backplane or short circuits.
4. Supply line voltage to meet power module rating. (Check side label.)

8.2 Output line checks

1. Output polarity to be correct. (Severe damage to the powered equipment might result in case of reverse polarity powering.)
2. Output voltage value 24 V. Check on side label of power modules.
3. Output conductors to be of adequate size and firmly secured with no exposed risking contacts with the backplane or short circuits.
4. Load sharing DIP switches configuration are set. (See section 6.4.)

8.3 Alarm lines checks

1. Alarm circuit to be correctly wired and conductors firmly secured with no exposed conductors risking contacts with the backplane or short circuits.
2. Alarm DIP switches configuration set. (See section 6.4.)

8.4 Commissioning

1. Pull out all modules from the backplane
2. Disconnect load on the 24 V output bus and switch the input mains ON.
3. Plug one of the PS3500 modules in slot 1 of the backplane and validate the output to be within the limits (for a 24 V nominal output, 23.6 V to 24.24 V).

Factory default for the modules is 24 V +/-1%. If a different output voltage is required (within the 22.5 V to 28 V range), adjust the potentiometer on the backplane to obtain the desired output.

4. Repeat step 3, using the same module plugged in the backplane slot 2, 3, etc., and check the output voltage to be within the limits
5. Turn power off, reconnect the load plug in and tighten all modules on the backplane with the fixing screws.
6. Turn power ON. Only the green LED should appear (no alarms). If any alarm is displayed, check mains voltage, module configuration and adjustment. If problem remains refer to the troubleshooting section.

9 Maintenance & Repair

1. Supply systems do not require special maintenance except normal periodic functional checks and cleaning.
2. Keep power modules air inlets and outlets free from dust or particles that may prevent free air circulation through the cabinet and in the enclosure. Accumulation of dust on heat dissipating surface limits heat exchange with the surrounding air reducing heat-sinking capabilities.
3. Periodically (every year) check and record the output voltage value to capture any long-term deviation.
4. PS3500 power supply products operated in conjunction with hazardous areas must not be modified. If there is a defect, the product must always be replaced. Defective housing parts must be replaced by original parts only. For detailed information please refer to the respective data sheet. Tasks for eliminating malfunctions must be performed only by specialists who are specially trained and authorized for the task.

   Contact customer service for an RMA (return merchandise authorization). Returns for repair should be sent to:

   Pepperl+Fuchs, Inc.
   1600 Enterprise Pkwy.
   Twinsburg, OH 44087-2245

10 Troubleshooting

Error condition	Corrective action
Low/high output voltage	Using a voltage meter: • Measure the output voltage to identify error type. • Measure input voltage to ensure the voltage range is within proper limits. • If output voltage is low, measure output current to ensure that it does not exceed 15 A per module. • If modules are load sharing, make sure DIP switches are configured properly and that each of the modules is supplying the same voltage. • If error persists, module needs to be replaced.
Over-voltage shutdown	Identify faulty module using a voltage meter: • Measure input voltage to ensure the voltage range is within the proper limit. • Unplug the module and then plug back in. • If error persists, module needs replaced.
Unequal load sharing	Using a voltage meter: • Measure input voltage to ensure proper range. • Measure the output voltage of each module, and if needed, adjust voltage potentiometer on backplane so that each module supplies the same voltage. • If problem persists, replace module.
Alarm LED illuminated	Check module alarm configuration. • Ensure DIP switches are set properly for serial or parallel alarm. • Repeat first three steps (above) for previously mentioned error conditions. • If alarm persists, replace module.

11 Special warnings!

Warning

1. **Warning - Explosion hazard - do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.**
   Avertissement – Risque d'explosion - avant de déconnecter l'equipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux.

2. **Exposure to some chemicals may degrade the sealing properties of materials used in the following devices:**
   Panasonic DS series sealed relay (The case is thermal setting PBT with an epoxy resin encapsulant.)
   Warning – Substitution of the following components may impair suitability for Division 2:

   - **Reference designation: RL1**
   - **Description: Relay**
   - **Type of protection: Sealed contacts**

   Avertissement - L'exposition à certains produits chimiques mai dégrader la fermeture des propriétés des matériaux utilisés dans les appareils suivants.
   Panasonic DS series sealed relay (The case is thermal setting PBT with an epoxy resin encapsulant.)
   Avertissement – Risque d'explosion – la substitution se composants peut render ce matériel inacceptable pour les emplacements de Classe 1, Division 2:

   - **Reference designation: RL1**
   - **Description: Relay**
   - **Type of protection: Sealed contacts**

3. **Warning - Explosion hazard - do not remove fuses or plug-in modules (as applicable) unless power has been disconnected or the area is known to be free of ignitable concentrations of flammable gases or vapors.**
   Avertissement – Risque d'explosion – Ne pas retirer les fusibles ou les plug-in modules (selon le cas) que si le pouvoir a été déconnecté ou la région est connue pour être exempts de inflammable concentrations de gaz inflammables ou vapeurs.

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12 Notes

12 Notes

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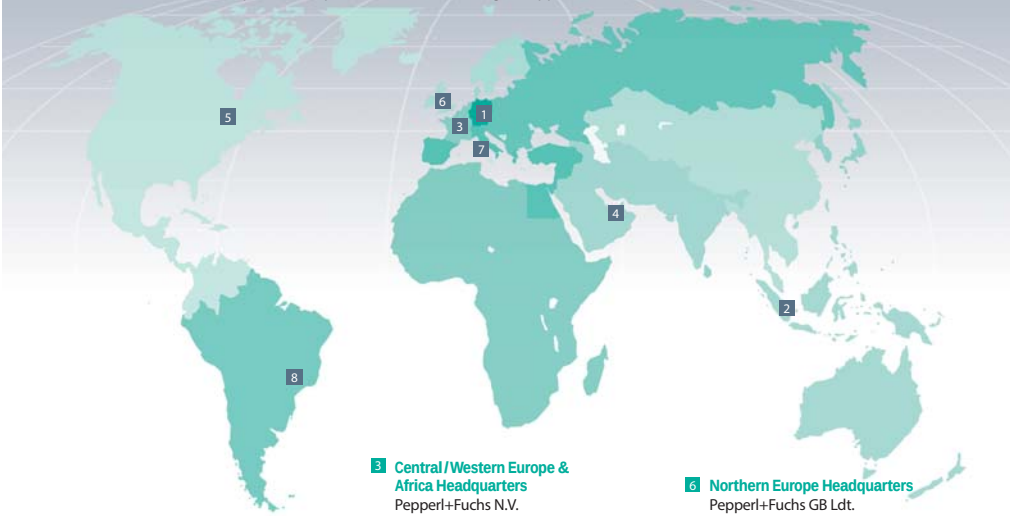

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